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(54) Device for making coffee.

(57) A machine for making coffee with a cylindrical chamber (2) in which the head walls are made up of an equal number of pistons (3), (5) mounted on circulating ball screw actuators (9), (16).

Once the coffee powder is put into the chamber (2), the pistons (3), (5) are brought together to exert pressure, after which hot water is introduced to make the infusion.

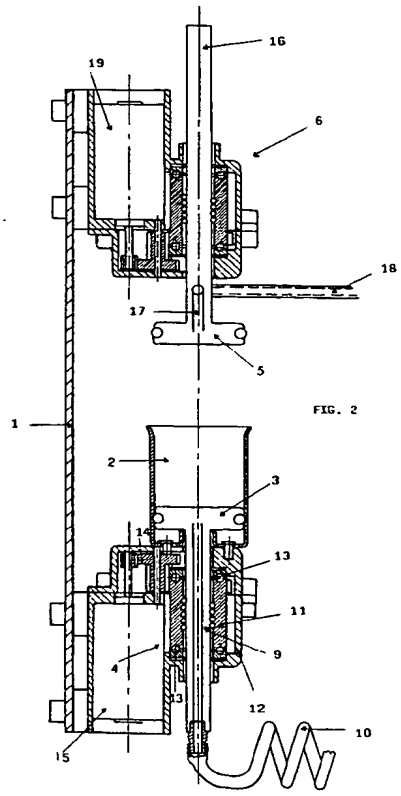

FIG. 2

EP 0 496 940 A1

This invention proposes a device for making coffee, comprising a cylindrical chamber whose head walls have a number of pistons mounted on linear actuators of the screw and/or circulating ball type.

The walls of the pistons are made up of the same number of filters which allow the passage of hot water to obtain the infusion.

The new invention is characterized by a particular configuration of parts which gives a smaller overall unit, costs less, and is thus suited to applications in vehicles or for domestic use etc..

Machines are well-known for making coffee which have a chamber with a pair of moving walls worked hydraulically, and which have ducts for the conduction of hot water and for the removal of the coffee infusion.

A measured amount of powdered coffee is introduced into the chamber and is then pressed by the moving walls followed by extraction.

Because of the hydrualic mechanism for moving the walls these machines are mechanically quite complicated and consequently bulky and expensive. They are thus suited to high rates of output which limits their application to places such as canteens, factories or anywhere where there is a high rate of consumption.

Other machines of the type described above are also common, in which the chamber where extraction takes place has at least one moving wall which is activated by electromechanical devices comprising a motor and a transformer which works a mechsnism of cams and rods or similar for compression of the powder.

These machines, though less expensive than the preceding ones, present greater problems when used which limits their lifespan, and they are in any case still quite bulky.

It is in this context, then, that the current invention is set, proposing a device for making coffee comprising a chamber which is basically cylindrical with moving head walls, connected to a system for the conduction and emptying of a liquid, in which the movements of said walls take place by way of a linear screw and/or circulating ball actuator.

This allows the unit to be very compact and economical and especially suited to applications in buses or vehicles in general, and for home use.

The current invention will now be described in detail to give a general example, with particular reference to the enclosed drawings where:

- fig. 1 shows a lateral view of a device as per the invention
- fig.2 is a vertical section of the device in fig.1.

With reference to fig.1 the invention consists of a support (1) on which a unit is mounted made up of a receptacle (2) into which a piston (3) runs (fig.2) worked by an actuator indicated overall by the number 4 and in the upper part a second piston (5) worked by a second actuator the same as the first, indicated overall as number 6.

At the side of the actuator unit (2) is a base or support (7) for a container (8) which receives the coffee infusion. The piston (3) forms a unit with the shaft (9), being hollow and connected through a flexible tube (10) to a hot water supply which is not illustrated in the drawing and is not described, not beign part of the invention.

The external part of the shaft (9) is threaded to form the shaft of a linear screw and/or circulating ball actuator, the body of which (11) is mounted in the casing (12) of the actuator by thrust bearings-(13).

The body (11) has external teething engaged into the corresponding teething of a reducer (14) which is activated by an electric motor (15) or similar.

Similarly, the upper piston shaft (16) is part of the linear screw and/or circulating ball actuator, as described previously.

The shaft also has a section of a small channel (17) directed towards a duct (18) for emptying the coffee infusion into the receptacle(8).

The machine is then completed by other devices which are not illustrated in that they are already well-known, such as end of run microswitches for the pistons (3 and 5), devices for putting a measured amount of coffee powder into the receptacle(2) and for heating and pumping the water.

The invention functions as follows.

The device is set in motion, for example by bringing the water up to the required temperature, and the powdered coffee is put into the recipient (2), either measured out separately or in filter bags or by similar means.

The control devices then activate the motors (15 and 19) which, through their reducers, activate the actuators (4 and 6) and cause pistons shafts (9 and 16) to move along their axes.

The piston (5) is introduced into the receptacle (2) while the lower piston (3) is pushed upwards to compress the coffee powder between the two filter walls of the pistons. At this point a predetermined quantity of water heated to the required temperature enters the chamber along the duct (10) and the shaft (9).

The hot water passes through the powdered coffee and the infusion comes out along the passage (17) and the duct (18) to be collected in the cup (8).

The piston (5) can now be raised to free access to the container (2) for the withdrawal of the used coffee powder and to start another cycle.

If required, the machine management pro-

gramme may also include raising the piston to the upper edge of the container (2), to facilitate cleaning and removal of the used coffee. With the configuration described considerable advantages are derived, in that the use of linear screw and/or circulating ball actuators means that cost and size of the machine can be greatly reduced.

These actuators can in fact be run with low-powered motors which are economical and small thus producing a small overall actuator. This leads to cost advantages even for machines used infrequently or for domestic use.

Obviously the dimensions as well as the materials used may vary depending on the use to which the machine is put.

Claims

1. A device for making coffee, characterized by an essentially cylindrical chamber with the head walls made of a number of sliding pistons inside said chamber, and a method for compressing a measured amount of powdered coffee between said pistons, pumping hot water into the chamber through the shaft of a piston and collecting the infusion through the shaft of the second piston.

2. A device for making coffee as per claim 1, characterized by the fact that movement of the pistons is by way of an equal number of linear screw and/or circulating ball actuators.

3. Device for the production of coffee as per claim 2, characterized by the fact that the screws of said actuators are formed by the shafts of said pistons.

4. Device for making coffee comprising:
   - an essentially cylindrical receptacle closed at the bottom by a piston connected to a system for introducing hot water into the receptacle;
   - a circulating ball actuator in which the sliding part is the shaft of the piston;
   - a geared motor unit for powering said actuator;
   - a second piston which enters said receptacle from above;
   - a motor-actuator unit similar to the one previously described, placed above the previous one to power the second piston;
   - a duct for the emptying of the coffee infusion, in the shaft of the second piston.

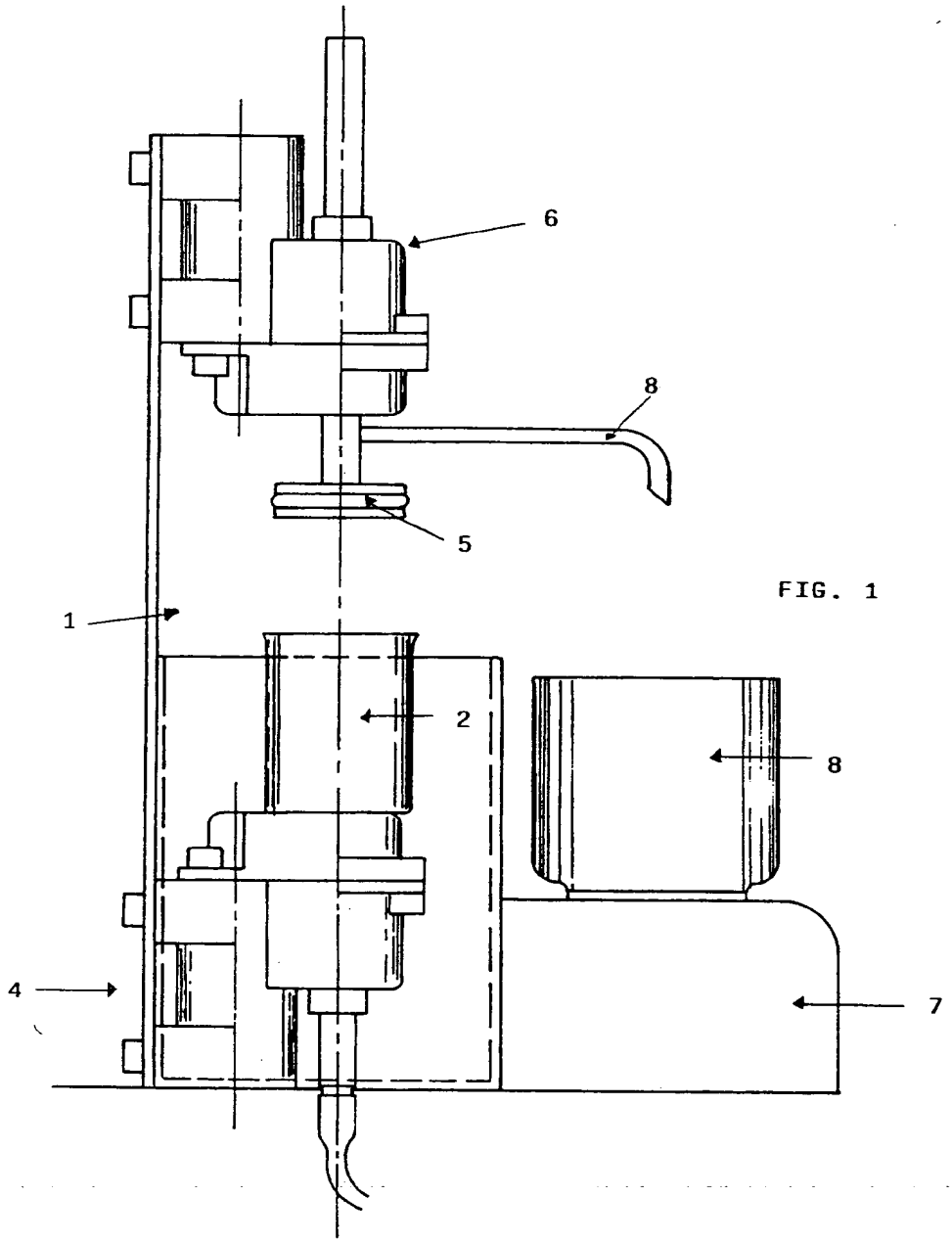

FIG. 1

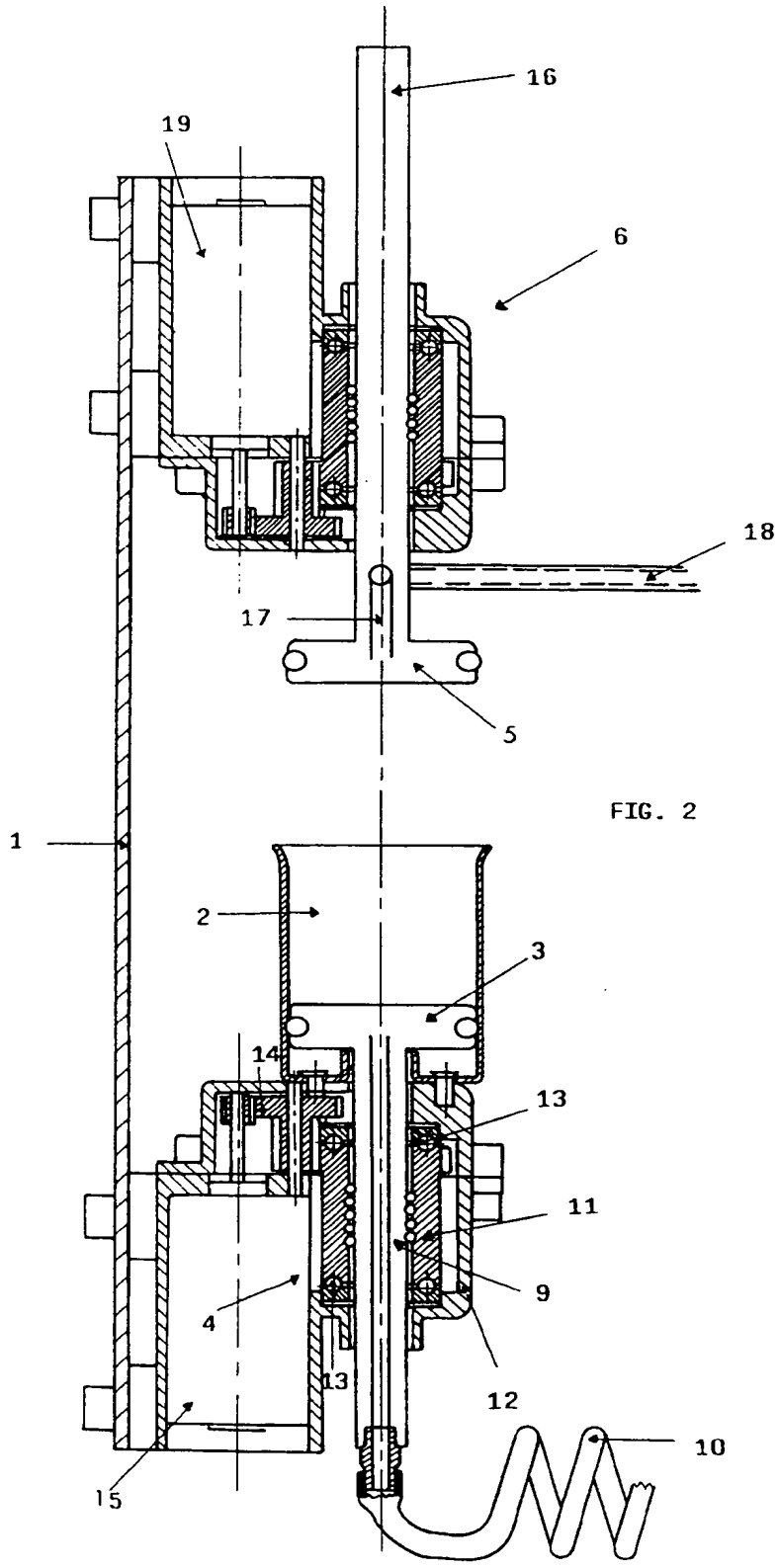

FIG. 2

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EUROPEAN SEARCH REPORT

Application Number

EP 91 11 6113

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	EP-A-0 309 780 (CINONI) * column 3, line 31 - column 4, line 9; figures 1,2 *	1	A47J31/40
Y		2-4	
Y	DE-C-3 615 158 (CAFINA AG) * page 5, line 46 - page 6, line 2; figures 1-3 *	2-4	
A	FR-A-2 452 905 (VALENTE & PILONI) * page 3, line 11 - page 6, line 17; figures *	1-3	
A	EP-A-0 321 773 (ZANUSSI GRANDI IMPIANTI S.P.A.) * column 2, line 36 - column 3, line 12; figures 1,4 *	2	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

A47J

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	07 MAY 1992	VISTISEN L.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
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